**Moderator comments Sample 9**

|  |  |  |  |
| --- | --- | --- | --- |
| **Criterion** | **Pl** | **DCP** | **DEC** |
| Achievement level awarded | 6 | 5 | 5 |
| Achievement of aspects | c, c, c | c, c, p | p, c, c |

**Assessment**

**Planning**

**Defining the problem and selecting variables**

**Complete**

The aim is focused, the organism used is correctly identified and a prediction is given. Although this is not a requirement for the assessment of the planning criterion, it does help to identify the independent and dependent variables. No background information is included as some is given in the teacher’s instructions. The variables are specifically identified.

**Controlling variables**

**Complete**

The student attempts to keep the conditions the same in each test. The *Elodea* length and type of bottle used, how the samples will be placed under the light, and the method used to attach the [overhead projector](http://xmltwo.ibo.org/publications/migrated/production-app.ibo.org/publication/65/part/2/chapter/10/mode/moderator.html) sheets are all stated.

**Developing a method for the collection of data**

**Complete**

The samples of pond water are all from the same pond. Although the data collection is automated using a [data logger](http://xmltwo.ibo.org/publications/migrated/production-app.ibo.org/publication/65/part/2/chapter/10/mode/moderator.html), the student is responsible for the settings in the data collection. This is sufficient for aspect 3 of the planning criterion. Three replicates are performed for each light level and two samples at each light level are tested. The subjective nature of the stirring probe is offset by the six results recorded for each light level.

**Data collection and processing**

**Recording data**

**Complete**

The raw data from the two samples is recorded three times in a clear table. The units are given. The uncertainty of the probe is not given—this is not necessary as the probe reading is given three times for each sample.

**Processing data**

**Complete**

The averages of each dissolved oxygen (DO) level are calculated correctly and tabulated. The calculations for respiration, gross primary productivity (GPP) and net primary productivity (NPP) are correctly calculated and tabulated.

**Presenting processed data**

**Partial**

The calculations are presented as bar charts, which allow for effective analysis to support or disprove the prediction. The x-axes on the graphs, however, are not a continuous scale and so the relationships shown are misleading. This is a typical error when students use spreadsheets to plot graphs.

**Discussion, evaluation and conclusion**

**Discussing and reviewing**

**Partial**

The student is expected to include some explanation as to **why** light decreases with increased depth, and to mention some of the ecological implications of this (for example, decreased productivity in benthic areas, or [plants](http://xmltwo.ibo.org/publications/migrated/production-app.ibo.org/publication/65/part/2/chapter/10/mode/moderator.html) that absorb at different wavelengths). There is no reference to research literature.

**Evaluating procedure(s) and suggesting improvements**

**Complete**

The main weaknesses of the investigation, as revealed by the data that is collected, are identified. Realistic improvements are proposed for these weaknesses.

**Concluding**

**Complete**

A reasonable conclusion is stated based on the data obtained. The student makes an attempt to explain what has occurred.

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